

VITA

NAME: Motria Poshyvanyk Caudill

EDUCATION: B.A., Biology and Environmental Studies, Macalester College, St. Paul, Minnesota, 1992

M.S., Public Health Sciences, University of Illinois at Chicago, Chicago, Illinois, 1999. Thesis title: “Air Pollution Source Apportionment in Mariupol, Ukraine”

Ph.D., Public Health Sciences, University of Illinois at Chicago, Chicago, Illinois, 2010. Dissertation title: “Multivariate Receptor Modeling Applied to PM_{2.5} and Air Toxics Monitoring Sites in the Midwest”

APPOINTMENTS: 2012 – Present. Adjunct Assistance Professor, Environmental and Occupational Health Sciences Division, School of Public Health, University of Illinois at Chicago.

EMPLOYMENT: 2000 – Present. Environmental Scientist at U.S. Environmental Protection Agency, Region 5, Chicago, IL. Air quality monitoring and data analysis specialist with oversight of State/Local networks for National Ambient Air Quality Standards and hazardous air pollutants.

1997 – 1999. Research Assistant, UIC School of Public Health. Organized and executed multi-media environmental sampling plan in Mariupol, Ukraine as part of Family and Children of Ukraine study.

1994 – 1997. Environmental Scientist, Stanley Consultants, Chicago, IL. Performed asbestos inspections and Environmental Site Assessments.

1993 – 1994. Deputy Director of Regional Office, ISAR, Kyiv, Ukraine. USAID funded program to aid NGOs in Ukraine, Belarus, and Moldova.

TEACHING: Fundamentals of Ambient Air Monitoring and Introduction to Air Quality Data Analysis. USEPA training hosted by Pune Municipal Corporation. Pune, India. Coursework jointly developed and presented with Dr. Peter Scheff (UIC-SPH). September 10-12, 2003.

Quality Assured Ambient Air Monitoring and Introduction to Air Quality Data Analysis. USEPA training hosted by US-Asia Environmental Partnership. Hanoi, Vietnam. Coursework jointly developed and presented with Dr. Peter Scheff (UIC-SPH). February 28-March 4, 2005.

Guest lecturer on subjects of ambient air monitoring, network design, data analysis, and air toxics regulatory programs at UIC School of Public Health, courses EOHS 431 Air Quality Management and EOHS 556 Risk Assessment in Environmental Health. Multiple dates, 2006-2014.

PUBLICATIONS: Mucha, A.P., Hryhorczuk, D., Serdyuk, A., Nokonechny, J., Zvinchuk, A., Erdal, S., Caudill, M., Scheff, P., Lukyanova, E., Shkiryak-Nyzhnyk, Z., Chislovska, and N.: Urinary 1-hydroxypyrene as a biomarker of PAH exposure in 3-year-old Ukrainian children. Environmental Health Perspectives 114:603-609, 2006.

PRESENTED PAPERS: Scheff, P. A., Hryhorczuk, D., Poshyvanyk, M., and Nakonechniy, J. "Air Quality Assessment in Mariupol, Ukraine" Air and Waste Management Association 93th Annual Conference and Exhibition. Salt Lake City, UT. June 2000.

Caudill, M. P., Scheff, P.A., and Erdal, S. "Temporal Trends of Ambient Benzene Concentrations in USEPA Region 5". Air and Waste Management Association 97th Annual Conference and Exhibition. Indianapolis, IN. June 2004.

Allen, M., Caudill, M.P., Dayton, D., Downey, P., Fenlon, D., Heindorf, M.A., Jones, G., Patel, B., Scheff, P.A., Schifsky, M., Schuchardt, M., Swift, J., and Whipple, W. "Results of Air Toxics Inter-lab Comparability Study Conducted by State Agencies within EPA Region 5." Air and Waste Management Association 98th Annual Conference and Exhibition. Minneapolis, MN. June 2005.

Kelly, T., Dindal, A., Caudill, M., Jones, M., and McKernan, J. "Field Evaluation of the Xact 625 Ambient Metals Monitor." Air and Waste Management Association, Air Quality Measurement Methods and Technology Conference. Durham, NC. April 2012.

SUMMARY OF KEY PROJECTS AT USEPA

Air Monitoring Network Design & Assessment

Midwest PM_{2.5} Monitoring Network Assessment; 2000-2001.

Chief data analyst for assessment of 251-site PM_{2.5} network. The objective was to identify high- and low-value stations based on monitor correlations, site density, population change, and other factors. Results were used by State air monitoring agencies in network redesigns. This analysis was adopted by USEPA's national Office of Air Quality Planning and Standards (OAQPS) as an example of recommended methods for the 5-Year Regional Monitoring Network Assessment.

EPA Spatial Data Analysis Technical Exchange Workshop – Dec. 3-5, 2001, RTP, NC:
www.epa.gov/ttnamti1/files/ambient/pm25/workshop/spatial/rizzo.pdf

Lead-Pb Monitoring Network Design, 2008-2014.

Chief scientist with oversight of State implementation of new Pb monitoring requirements under revised National Ambient Air Quality Standard (NAAQS). The new rule was promulgated in October 2008, including requirements for monitoring near industrial sources that emit greater than 0.5 ton per year of Pb. A team of emissions inventory and dispersion modeling specialists were required to first sort out conflicting inventory data and determine which sources are subject to the rule, then work with the States to review modeling and properly site new monitors. Ultimately 23 new sites were deployed between 2009-2012, three of which have already violated the revised NAAQS and are being designated as nonattainment. More recently, low-reading monitors have been approved for shut-down and monitoring is being considered for new large Pb emitters.

Technical Support for Air Toxics Monitoring & Data Analysis

Air Toxics Monitoring Technical Officer; 2001-present.

Lead scientist providing technical support to air monitoring agencies in EPA Region 5 on appropriate methods for sampling, laboratory analysis and data interpretation of hazardous air pollutants. Provide technical review on workplans and status reports for agencies operating National Air Toxics Trends Station (NATTS) sites. Technical officer on multiple grants under EPA Community Scale Air Toxics Monitoring program, for example:

- Detroit-Delray Community Monitoring Project -
epa.gov/ttn/amtic/files/20032004csatam/CSM0304MIDEQFR.pdf
- Calibrating Concern About PAHs (Polycyclic Aromatic Hydrocarbons) in Urban Air Using Monitoring and Modeling
<http://www.epa.gov/ttn/amtic/files/2011csatam/MNPCA.pdf>
- Southwest Indianapolis Air Toxics Study -
epa.gov/ttn/amtic/files/20052006csatam/SIATSGrantreportdec2009.pdf

Region 5 Air Toxics Laboratory Inter-Comparison Program, 2001-present.

Project coordinator and data analyst for “round robin” effort to improve quality assurance of VOC, carbonyl, and toxic metals analyses performed by State laboratories. Parallel ambient samples collected and distributed to participants; data analysis performed to quantify variability from the group mean, i.e. a surrogate for the unknown “true” value. The program has identified labs with degraded standard gases and staff in need of training.

2009 EPA Air Monitoring Conference: www.epa.gov/ttnamti1/files/2009conference/Caudill.pdf

Binational Air Monitoring Study in Sault Ste. Marie, Ontario-Michigan, 2004-2006.

Technical advisor for air monitoring grant implemented by Inter-Tribal Council of Michigan. This is a small town impacted by a large steel plant across the border with Canada. Primary author and data analyst for chapters pertaining to U.S. monitoring in binational study: “Informal Consultation on Local Air Issues in Sault Ste. Marie, Ontario-Michigan under the Canada-United States Air Quality Agreement: Technical Support Document on Air Quality 2001-2003.”

www.scribd.com/doc/1547640/Environmental-Protection-Agency-transboundary-air-quality-studyfinal073007

Air Toxics Characterization, Risk Screening, & Source Apportionment

Regional Air Quality Indicator in EPA’s Report on the Environment (ROE), 2004-present.

Author and data analyst for ambient air manganese indicator in national annual report produced by Office of Research and Development (ORD). The initial proposal of manganese compounds as an indicator specific to Region 5 made the case for the importance and validity of this metric, including internal and external peer review. The population of Region 5 is disproportionately impacted by emissions of this neurotoxic metal and ambient data are readily available. cfpub.epa.gov/eroe/index.cfm?fuseaction=detail.viewInd&ch=46&subtop=341&lv=list.listByChapter&r=231334

Region 5 Air Toxics Monitoring Risk Screen and Source Identification, 2006-present.

Lead scientist for annual cancer and non-cancer risk screening of VOC, carbonyl, PAH, and toxic metals data reported by State, Local and Tribal monitoring agencies. Developed Oracle-based query to screen out sites where annual pollutant concentrations exceed appropriate health benchmarks, suggesting areas to target for detailed risk characterization and reduction. Wind direction analysis conducted and emissions inventory consulted to identify contributing sources. Results are shared with enforcement for use in Notices of Violation. Testified in federal court regarding findings that a coke oven caused elevated cancer risk in an Ohio community. Toxic metals data collected near steel plants and VOC sampling near coke ovens both showed increased health risk and results provided to EPA-HQ for use in MACT industrial rule development.

2011 National Air Toxics Monitoring and Data Analysis Workshop; April 4 – 7, 2011; Dallas TX epa.gov/ttn/amtic/files/ambient/airtox/2011workshop/day2Region5Update.pdf

Receptor modeling of PM_{2.5} and VOCs, 2008-2010.

Independent work for Ph.D. dissertation. Applied Positive Matrix Factorization (PMF) receptor model to fine speciated particulate and air toxics data at four Midwestern sites. Source factors were identified and quantified separately for PM_{2.5} and VOCs at each site, then compared across methods via Spearman correlation. This effort pointed to mobile-source emissions as an important area to focus on for reduction of criteria pollutants and air toxics health risks. It also demonstrated the possibilities and limitations of multi-pollutant modeling and control strategies.

epa.gov/ttn/amtic/files/ambient/airtox/2011workshop/day3techMotriaCaudillMultivariate.pdf

New Monitoring Technology Testing

Semi-continuous metals monitor technology verification testing, 2010-ongoing.

Author of grant proposal to conduct field testing of the Xact 625 Fenceline Monitor and comparison with traditional sampling technology. Grant manager on ORD project to conduct Environmental Technology Verification study which has shown that results from real-time monitor with built-in XRF are comparable to traditional filter-based EPA methods. Primary investigator on multiple subsequent short-term investigations of Pb and toxic metals near steelmaking facilities, scrap recyclers, an ammunition manufacturer, and a hazardous wastewater incinerator.

Method verification of passive diffusion tubes for VOCs, 2012-ongoing.

Coordinator of EPA efforts to conduct parallel sampling using Carbopack-X diffusive tubes and traditional Summa canisters in industrial communities of Granite City and East St. Louis, IL. Laboratory support was provided by EPA-ORD and field sampling was performed in summer 2012 with cooperation of Metro East Citizens Air Project, University of Illinois at Urbana-Champaign. Primary investigator for new method comparison study underway at BP Refinery in Whiting, Indiana. Existing fenceline auto-GC monitors are collocated with passive tubes and Summa canisters for a three-way methodological comparison.